Chapter Forty-one SPECIAL DESIGN ELEMENTS

BUREAU OF LOCAL ROADS AND STREETS MANUAL

141005

Chapter Forty-one SPECIAL DESIGN ELEMENTS

41-1 CUL-DE-SACS, TURNAROUNDS, AND ALLEYS

41-1.01 <u>Cul-de-Sacs and Turnarounds</u>

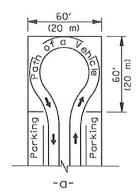
A local street, open at one end only, should have a special turning area at the closed end. This turning area may be an "L," "T," or circular shape cul-de-sac with dimensions as appropriate for the type of vehicles expected. The commonly used circular form should have a minimum outside radius of 30 ft (10 m) in residential areas and 50 ft (15 m) in commercial and industrial areas.

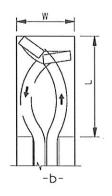
A dead-end street narrower than 40 ft (12 m) should be widened to enable passenger vehicles, delivery trucks, and emergency vehicles to make U-turns or at least turn around by backing only once. Typically, the design is circular pavement, symmetrical about the centerline of the street, sometimes with a central island, as shown in Figure 41-1A(a), which also shows minimum dimensions for the design vehicles. Although this type of cul-de-sac operates satisfactorily, improved operation is obtained if the design is offset so that the entrance-half of the pavement is in line with the approach-half of the street, as shown in Figure 41-1A(d). One steering reversal is avoided on this design. Where a radius of less than 50 ft (15 m) is used, provide mountable curbs on the island to permit maneuvering of an occasional oversized vehicle.

An all-paved plan, as opposed to an island configuration, with a 30 ft (10 m) outer radius, shown in Figure 41-1A(e), requires little additional paving. If the approach pavement is at least 30 ft (10 m) wide, the result is a cul-de-sac where passenger vehicles can make the customary U-turn and SU design trucks can turn by backing only once. A radius of about 40 ft (12 m) enables a WB-50 (WB-15) vehicle to turn around by maneuvering back and forth.

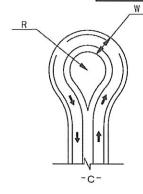
Other variations or shapes of cul-de-sacs that include right-of-way and site controls may be provided to permit vehicles to turn around by backing only once. Several types (e.g., Figures 41-1A(f), (g), and (i)) may also be suitable for alleys. The geometry of a cul-de-sac should be altered if adjoining residences also use the area for parking.

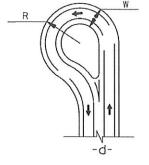
Generally, streets with cul-de-sacs should not be greater than 1,000 ft (300 m) in length.

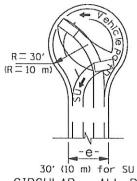




Design Vehicle	W	L
Р	30 ft (10 m)	60 ft (20 m)
SU	50 ft (15 m)	100 ft (30 m)





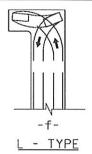


CIRCUL AR

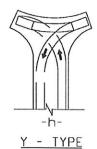
CIRCULAR - OFFSET

CIRCULAR - ALL PAVED

Design Vehicle	R	W
Р	30 ft (10 m)	18 ft (6 m)
WB-40 (WB-12)	42 ft (13 m)	25 ft (8 m)
SU & WB-50 (WB-15)	47 ft (15 m)	30 ft (10 m)









CUL-DE-SACS

Figure 41-1A

HIGHWAY DESIGN MANUAL

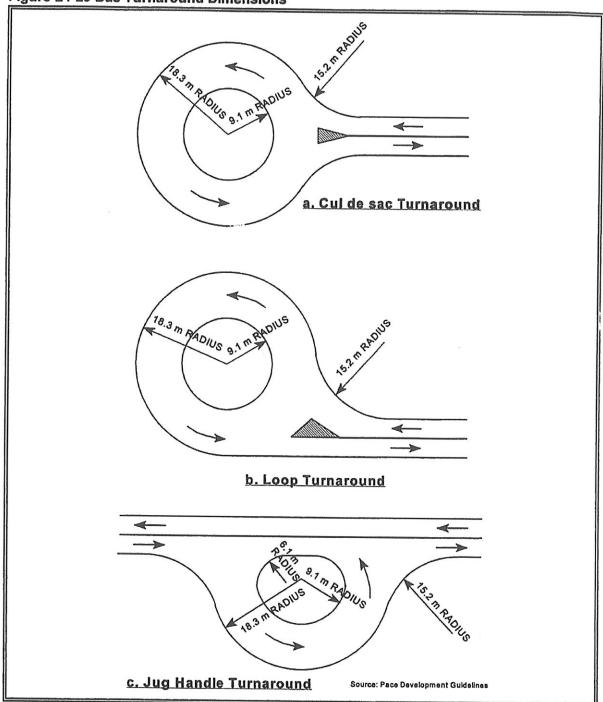
Chapter 24 - Mobility Measures

Revision 32

May 4, 1998

NY HWY

Figure 24-29 Bus Turnaround Dimensions





Transit Facilities Design Manual

SunLine Transit Agency

Thousand Palms, CA



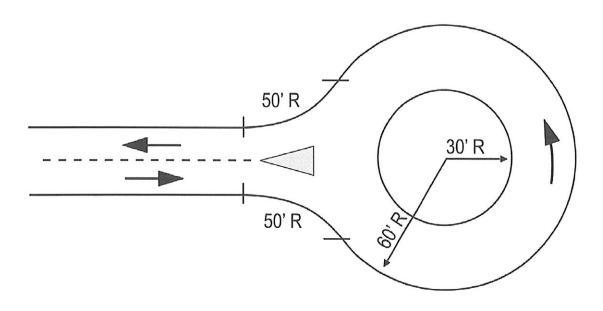
December, 2006



5.9 Bus Turnarounds

At the end of a route, a bus turnaround should be provided to enable the buses to return to the service routes. Ideally, this should be beyond the last stop at an off street location. A bus turnaround is a roadway facility that expedites a bus' return to the roadway or bus route, and can be incorporated into designs for new developments to allow the buses to operate onto the site. Bus turnarounds can be used for schedule adherence and service reliability since a continuous route is available for the buses. Bus turnaround facilities may be used as an off-street waiting and service area for transit passengers, and should be designed so the bus can be turned in a counter-clockwise direction for better visual capabilities for bus operators. They should also be designed for adequate space for a bus to pass a standing transit bus.

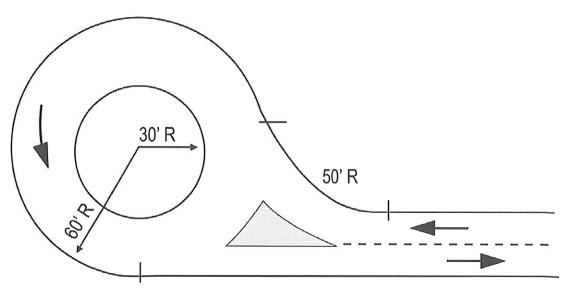
The "jug handle" bus turnaround design can be used at appropriate mid-block bus terminal locations to turn a transit bus. Proper signage or traffic signals along the roadway and at the turnaround are needed for traffic control and to expedite the bus to its route. The "cul-de-sac" and "loop" designs may be acceptable for developments that do not have roadway networks to return a bus efficiently to an arterial roadway. The "cul-de-sac" and "loop" turnarounds are only preferred at the end of bus routes at appropriate and approved locations. Suggested alternative configurations are illustrated below.



Source: PalmTran, Palm Beach County, Florida

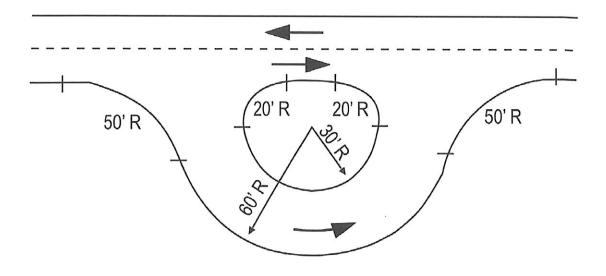
Figure 5.28 Design of a "Cul-de-Sac" Bus Turnaround





Source: PalmTran, Palm Beach County, Florida

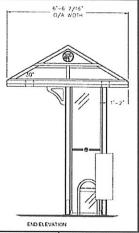
Figure 5.29 Design of a "Loop" Bus Turnaround



Source: PalmTran, Palm Beach County, Florida

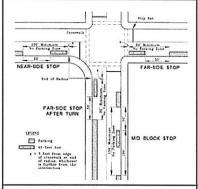
Figure 5.30 Design of a "Jug-Handle" Bus Turnaround

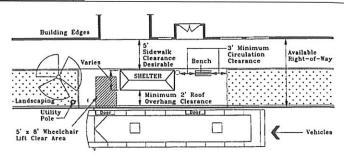


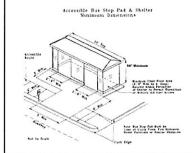


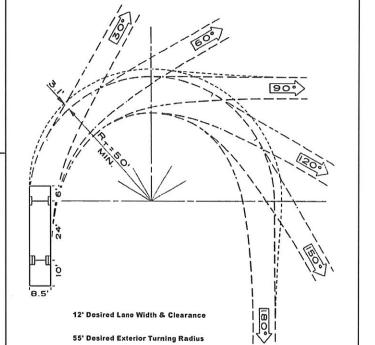


TRANSIT DESIGN MANUAL









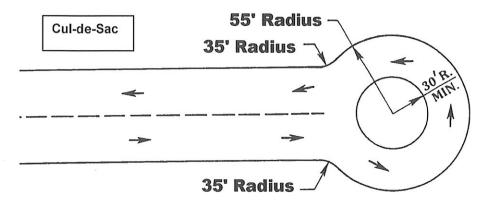


August, 2004

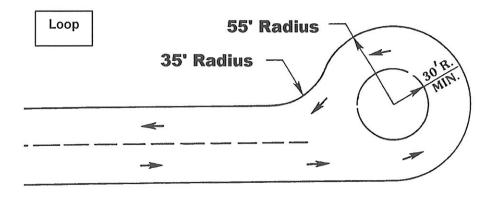
4.4.2 Bus Turnaround (Cul-de-Sac, Loop, Jug-Handle)

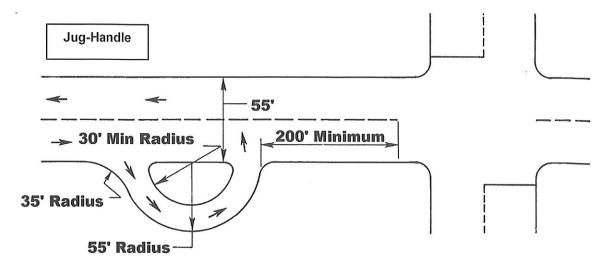
The preferred method for bus circulation and return to major arterials is via the internal street system. Occasionally, design constraints, trip time efficiency, or cost effectiveness will preclude this circulation pattern.

Often avoided because of their limited radii and residential atmosphere, a Cul-de-Sac with a sufficient turning radius can serve as a bus turnaround.



Outside loops and jug-handles may also serve as a method for bus circulation and return to a major arterial when the available street network, trip time efficiency or cost effectiveness do not permit alternative street circulation.



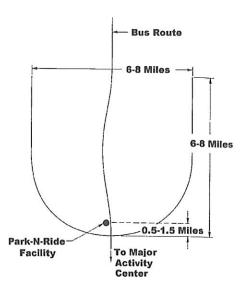


4.4.3 Park-N-Ride

A Park and Ride Facility is a parking garage and/or paved area used for parking passengers' automobiles, either free or fee paid, while they use Transit facilities. Park-and-ride facilities are generally established as collector sites for rail or bus service. Park-and-ride facilities may also serve as collector sites for vanpools and car pools, and as Transit centers.

The Transit Service Area for Park-N-Ride and Commuter Drop-Off facilities is much larger than for pedestrians, since its users arrive by automobile. Typically, it can extend as much as a mile and a half inbound from the facility, six to eight miles outbound from the facility and as many miles either side of a bus route.

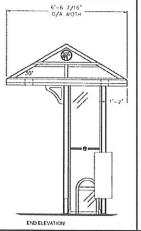
Specific ADA requirements for the number of accessible parking spots, accessible routes, and curbs and ramps will further dictate the land use composition of the Park-N-Ride.



4.4.4 Commuter Drop-Off

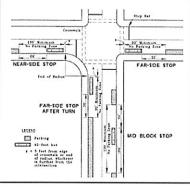
A Commuter Drop-Off facility is part of a Park-N-Ride facility where commuters who are passengers in non-Transit vehicles are dropped off to board a Transit vehicle.

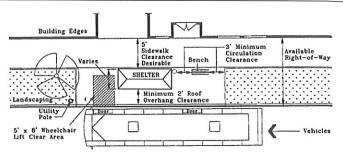


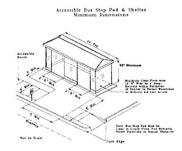


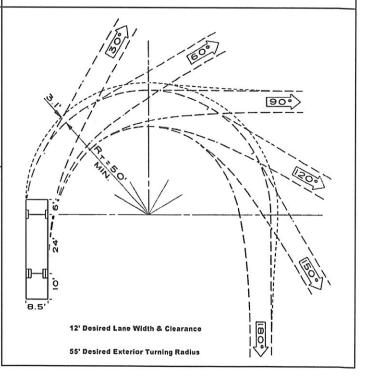


TRANSIT DESIGN MANUAL











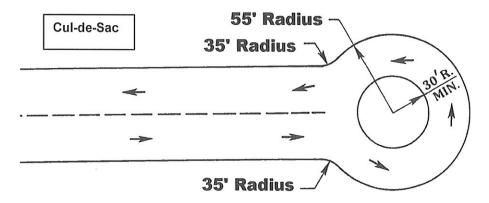
August, 2004



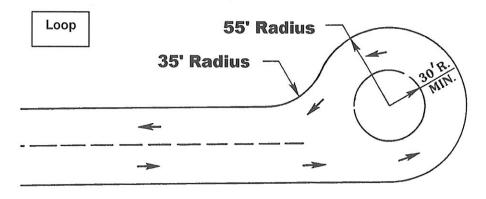
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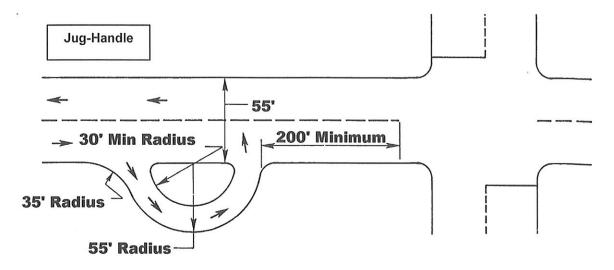
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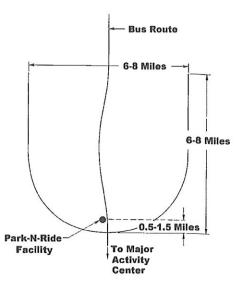


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